SINGLE-STAGE POWER FACTOR CORRECTED CAPACITOR CHARGER

ABSTRACT

Current (**ip**) flowing in the primary of a transformer in a full wave bridge converter is monitored and compared against thresholds (+imax, +imin, -imax, -imin). When the input voltage is adequate, the full wave bridge converter is operated in a normal manner. When the input voltage is insufficient to cause the current **ip** ramp reach the first threshold before a first predetermined timeout period (**t1**), the pulse is truncated and a next portion of the cycle is initiated and, providing that the current at the end of the first timeout period exceeds a second, lower threshold current (**+imin**), continuing to operate the full wave bridge converter in a normal manner. If the current at the end of the first timeout period fails to reach the second (**+imin**) threshold at the end of the timeout period (**t1**), then current in the primary winding is reversed and energy is stored in an inductor which is connected in series with the primary winding and said energy is transferred to a holding capacitor until sufficient voltage is stored to allow the converter to operate. The thresholds and cycle frequency are varied to allow a large power throughput variation that is used to modulate the input current for good power factor. The converter is designed to charge a capacitive load.